Metabolic ward studies have demonstrated that weight-maintaining diets of unrefined cereals and starch-containing vegetables (75% energy) produced within 14 days remission of mature-onset diabetes in 85% of patients; they discontinued antidiabetic drug therapy.³ After discharge patients were advised to continue a maintenance diet of unrefined cereals and starch vegetables (60% energy) and dietary fibre (neutral detergent fibre 50 g/d). All nine patients who elected not to continue this maintenance diet relapsed quickly; on the other hand, 15 patients who took the maintenance diet have been observed for 6-48 months without relapse (Anderson, personal communication, 1979). Dietary details were stated briefly in the cited article³; more detailed diets can be obtained from the authors, Veteran's Administration Center, Lexington, Kentucky 40507, USA.

D P BURKITT

Unit of Geographical Pathology,
St Thomas's Hospital Medical School,
London SE1 7EH

H C TROWELL

Woodgreen,
Nr Fordingbridge, Hants SP6 2AZ

¹ Morris, J N, Marr, J W, and Clayton, D G, *British Medical Journal*, 1977, **2**, 1307.

² Burkitt, D P, and Trowell, H C, *Refined Carbohydrate Foods and Disease: Some Implications of Dietary Fibre*, p 227. London, Academic Press, 1975.

³ Kiehm, T G, Anderson, J W, and Ward, K, *American Journal of Clinical Nutrition*, 1976, **28**, 895.

Altered bile in diabetic diarrhoea

SIR,—We would certainly agree with Dr J H B Scarpello (6 January, p 58) that cholestyramine has not always been helpful in the treatment of diabetic diarrhoea. There are many reasons why this is so and the following case history demonstrates that in an individual patient there may be more than one cause of "diabetic diarrhoea."

A 48-year-old man who had had diabetes for 18 years was referred with a long history of impotence and a 12-month history of poor control of diabetes and weakness of the legs. He had recently developed an ulcer on the left heel. Seven weeks before admission the patient started to complain of intermittent explosive watery diarrhoea, sometimes nocturnal, and sometimes this led to faecal incontinence. On examination he had diminished sensation in the feet and absent ankle jerks. The left foot was colder than the right with absent dorsalis pedis pulse and a necrotic ulcer on the heel. His blood pressure was 130/80 mm Hg standing and 130/90 mm Hg lying down. Barium enema, sigmoidoscopy, and stool culture for pathogenic organisms were negative. The results of the bile salt analysis are given in the accompanying table. There was a reduction in the fasting pool size and an increase in the faecal excretion of bile acids; 22.7% of the total bile acids were in deconjugated form. The patient responded to tetracycline therapy but the diarrhoea recurred. A ¹⁴C-glycocholate breath test, which is a non-invasive indirect test of bacterial overgrowth in the small bowel, was negative during this attack.

This patient had a considerable quantity of free bile acids in the small bowel, a situation strongly suggesting bacterial overgrowth. The patient responded dramatically to tetracycline but the response may have been fortuitous

since the condition of diabetic diarrhoea is one of spontaneous remission and relapse. A further attack was not associated with bacterial colonisation, as assessed by a ¹⁴C-glycocholate breath test; yet the patient again responded to tetracycline. This test has not been reported to give false-negative results in the contaminated-small-bowel syndrome.¹

In conclusion, although there are many causes of diabetic diarrhoea in the diabetic, our results² suggest that cholestyramine may be more appropriately used in prophylaxis between attacks of the diarrhoea, when the pool size is larger than normal, rather than in the diarrhoea stage, when the patients have small pool sizes.

A MOLLOY
GERALD TOMKIN

Metabolic Unit,
Adelaide Hospital,
Dublin 8

¹ Thaysen, E H, *Clinics in Gastroenterology*, 1977, **6**, 227.

² Molloy, A, and Tomkin, G H, *British Medical Journal*, 1978, **2**, 1462.

Shortening hospital stay for psychiatric care

SIR,—Professor S R Hirsch and others (17 February, p 442) described brief hospital stay for psychiatric patients. I note that he did not include relapse rate.

The records of schizophrenic patients admitted to Claybury Hospital in 1960 and 1961 were checked by me. In the subsequent 10 years the chances of readmission within six months of any admission were greater if they stayed in the hospital less than six weeks.

ROBERT J DOIG

Cane Hill Hospital,
Coulson, Surrey CR3 3YL

Epilepsy and learning

SIR,—The letter from Dr C R Haines (31 March, p 893) highlights the situation in which many school doctors find themselves where epilepsy is concerned. This association has urged in our reply to the Warnock Report that the problems presented by the trend towards confidentiality be overcome because the otherwise valuable role of the school doctor is hampered when information passes only between consultants and the general practitioner.

We have, therefore, endorsed any scheme whereby the specialist in community medicine (child health) would co-ordinate the flow of information between hospital, GPs, and the school doctors. We would hope that parents could be persuaded to give permission for dissemination of information in this way, and that each local education authority would promote such a scheme.

This association believes that a well-informed school medical officer may be a more appropriate person to hold the assessment files for children with special needs as envisaged by Warnock than the head teacher. In any event,

the school doctor should have access to these records as of right. We would hope that such an arrangement would provide teachers with the sort of practical help they need in meeting the special—and changeable—needs of children with epilepsy.

ANDREW GORDON CRAIG

Wokingham, Berks RG11 3AY

Schizophrenia-like psychosis after treatment with beta-blockers

SIR,—The cases reported by Drs J Steinhert and C R Pugh (24 March, p 790) of schizophrenic-like psychosis in patients treated with beta-blocking agents were particularly interesting, for although these drugs are widely used in cardiology they are being used increasingly for their peripheral effects. It is noteworthy that in the cases reported the onset of psychotic symptoms followed increase of dosage.

The authors make the point that it is uncertain whether beta-blockers have a central action, and this question has been asked ever since the drugs were discovered. Three possible modes of action can be envisaged. (1) By penetrating brain tissue these drugs may interrupt the flow of information channelled through β -adrenergic mechanisms. (2) They may have a direct action on sensitive neuronal networks independent of a specific beta-blocking property. (3) The possibility exists that a peripheral effect may be transmitted via neural or humoral channels, or both, to the central nervous system, becoming manifest in psychic and behavioural change.

There is evidence particularly from work on animals that central adrenergic systems exist which are involved in functional activities related to adjustment of awareness and arousal, learning processes, and regulation of muscle tone. There is also evidence that adrenergic receptors of the beta type exist in postsynaptic membranes, which are normally activated by adrenergic substances, but inactivated and made unresponsive by beta-blockers. Noradrenaline is released by and taken up by adrenergic terminals and because of its postsynaptic effects serves as an information carrier. Dahlström and Fuxe, by demonstrating the existence of monoamine-containing neurones in the central nervous system in mammals, have paved the way for the discovery of catecholamine-containing cell bodies, or "nuclei," which give rise to descending and ascending catecholaminergic fibres. While there is an extreme degree of divergence in these noradrenergic systems, they include in their territory a huge number of cells. Certain portions of these systems seem to be involved in the control of the level of vigilance, which is in keeping with the anatomical structure of the locus ceruleus, which has relatively few cells capable of establishing contact with numerous cells in the forebrain and neocortex. Electric stimulation of this area in cats induces electroencephalographic arousal, accompanied by dilatation of the pupil, contractions of the nictitating membrane, a rise in blood pressure, and increase followed by decrease in the heart rate.

While data thus far available do not yet permit the exact site and mode of action by which beta-blockers exert their influence on the central nervous system to be identified, it is interesting to note the work of Atsmon *et al.*,¹ who treated a psychotic woman with porphyria in Tel Aviv with large doses of propranolol for her hypertension. The treatment produced

Bile salt pool size and composition in the patient and a control (mean ($\pm$ SE of mean)) of recently diagnosed diabetic patients without complications

Glycine:taurine ratio	Trihydroxy: dihydroxy ratio	Fasting pool size (mmol)	Free bile acids (% of total)	Faecal bile acids (mmol/24 h)
3.3 (2.5 $\pm$ 0.4)	1.00 (1.25 $\pm$ 0.1)	5.544 (6.672 $\pm$ 0.389)	22.7 (none detected)	2.225 (0.900 $\pm$ 0.180)